

CLAIMS

1. A method for aminoacylating a tRNA characterized in that, in the production of an aminoacyl-tRNA by selectively aminoacylating a tRNA, the tRNA and an amino acid are brought close to each other to react with each other.
2. The aminoacylation method according to claim 1, wherein the tRNA and the amino acid are enclosed in the vicinity of the micelle-water interface and brought close to each other to react with each other.
3. The aminoacylation method according to claim 2, wherein the carboxyl group of the amino acid is activated and enclosed in the micelle, and only the hydroxyl group region at the 3' end of the tRNA is inserted in the vicinity of the micelle-water interface, whereby the hydroxyl group at the 3' end and the activated carboxyl group are brought close to each other in the vicinity of the micelle-water interface to react with each other.
4. The aminoacylation method according to claim 2, wherein the carboxyl group of the amino acid is activated inside the micelle by using a condensing agent, and only the hydroxyl group region at the 3' end of the tRNA is inserted in the vicinity of the micelle-water interface, whereby the hydroxyl group at the 3' end and the activated carboxyl group are brought close to each other in the vicinity of the micelle-water interface to react with each other.
5. The aminoacylation method according to claim 3 or 4, wherein the 3' end group region is rendered hydrophobic by site-specifically and complementarily binding a peptide nucleic acid in which a hydrophobic functional group has been introduced at the end thereof to the tRNA in such a manner that the hydrophobic group comes close to the vicinity of the 3' end of the tRNA, whereby only the hydroxyl group region at the 3' end of the tRNA is inserted in the vicinity of the micelle-water interface.
6. The aminoacylation method according to any one of claims 2 to 5, wherein an amino

acid whose amino group has been protected is used.

7. The aminoacylation method according to any one of claims 2 to 6, wherein the reaction is carried out in the presence of a surfactant.
8. The aminoacylation method according to any one of claims 2 to 6, wherein the reaction is carried out in the presence of polyethyleneimine or a dendrimer with a cationic group on a surface thereof.
9. The aminoacylation method according to any one of claims 2 to 8, wherein the reaction is carried out in an O/W (oil in water) type micelle.
10. The aminoacylation method according to any one of claims 2 to 8, wherein the reaction is carried out in an oil free system.
11. The aminoacylation method according to any one of claims 2 to 10, wherein the reaction is carried out by using a transesterification catalyst exhibiting a high catalytic activity at around a neutral pH.
12. The aminoacylation method according to claim 1, wherein a peptide nucleic acid specifically and complementarily binding to the tRNA is interposed as an antisense molecule, whereby the tRNA and the amino acid are brought close to each other to react with each other.
13. The aminoacylation method according to claim 12, wherein the amino acid is bound to the antisense molecule through an ester bond in advance and reacted with the tRNA.
14. The aminoacylation method according to claim 13, wherein the reaction is carried out by using the one in which the amino acid has been bound to the antisense molecule through an active ester.
15. The aminoacylation method according to claim 14, wherein the reaction is carried out by using the one in which a linker has been provided between the antisense molecule and the active ester.
16. The aminoacylation method according to any one of claims 13 to 15, wherein the

one in which a cationic amino acid has been introduced at the other end of the antisense molecule is used.

17. The aminoacylation method according to claim 12, wherein the reaction with the tRNA is carried out by using a compound represented by the following formula [1]:



[wherein -cAm- represents a cationic amino acid residue or an oligopeptide residue consisted of 2 to 5 cationic amino acids, -PNA- represents a peptide nucleic acid residue, -L- represents a linker, -E- represents an active ester residue, and -Am represents an amino acid residue to be introduced in the tRNA].

18. The aminoacylation method according to any one of claims 12 to 17, wherein the reaction is carried out by using a transesterification catalyst exhibiting a high catalytic activity at around a neutral pH.

19. The aminoacylation method according to any one of claims 12 to 18, wherein a reaction terminator is used.

20. The aminoacylation method according to claim 19, wherein the reaction terminator is a peptide nucleic acid which forms a complementary pair with the peptide nucleic acid specifically and complementarily binding to the tRNA.

21. The aminoacylation method according to any one of claims 12 to 18, wherein the reaction is carried out by using further DNA as the antisense molecule other than the peptide nucleic acid which specifically and complementarily binds to the tRNA.

22. The aminoacylation method according to claim 21, wherein the reaction is terminated by raising the temperature of a reaction system.

23. The aminoacylation method according to claim 22, wherein the reaction is terminated by raising the temperature of the reaction system to 25°C.

24. A compound represented by the formula [1]:

H-cAm-PNA-L-E-Am

[1]

[wherein -cAm- represents a cationic amino acid residue or an oligopeptide residue consisted of 2 to 5 cationic amino acids, -PNA- represents a peptide nucleic acid residue, -L- represents a linker, -E- represents an active ester residue, and -Am represents an amino acid residue to be introduced in the tRNA].

25. The compound according to claim 24, wherein, in the formula [1], -cAm- is -LysLys-, -PNA- is -CGTGGT-, and -Am is a nonnatural amino acid.